

इंटरनेट

मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 6740 (1985): Gudgeon pins for internal combustion engines [TED 2: Automotive Primemovers]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Internal Combustion Engines Sectional Committee, EDC 14; and Piston Assembly Components Subcommittee, EDC 14.1 [Ref : Doc : EDC 14 (3478)]

Indian Standard
SPECIFICATION FOR
GUDGEON PINS FOR INTERNAL COMBUSTION ENGINES
(First Revision)

1. Scope — Covers the technical requirements of gudgeon pins suitable for single acting reciprocating internal combustion engines.

1.1 Range of Application — Shall be as given below:

- a) Gudgeon pins for petrol engines : 8 to 30 mm diameter
- b) Gudgeon pins for diesel engines : 22 to 80 mm diameter

2. Material — The steels used for gudgeon pins shall be of case-hardening quality conforming to the following:

- IS : 1570-1961 'Schedules for wrought steels for general engineering purposes'. (for nitriding steels).
- IS : 1570 (Part 2) - 1979 'Schedule for wrought steels for general engineering purposes, Part 2 Carbon steels (unalloyed steels) (first revision)'.
- IS : 4432-1967 'Case hardening steels'.

3. Dimensions

3.1 Dimensions shall be as agreed upon between the purchaser and the manufacturer. On enquiry and order, the dimensions alongwith tolerances given in 4.1 shall be furnished.

3.2 Gudgeon pins shall have straight, tapered or stepped bores according to the application. However, straight bores shall be preferred.

4. Tolerances on Dimensions

4.1 Tolerances on dimensions shall be as given in Table 1.

4.1.1 Where sub-division of the diametral tolerances is not adopted, permissible tolerance for gudgeon pin shall be as follows:

Outside Diameter d_1 mm	Tolerance mm
Up to 18	— 0.003
Above 18 up to 30	— 0.004
Above 30 up to 50	— 0.005
Above 50 up to 65	— 0.006
Above 65 up to 80	— 0.007

5. Hardness

5.1 Surface Hardness — Shall be between 58 to 65 HRC as determined by the method prescribed in IS : 1586-1968 'Methods for Rockwell hardness test (B and C scales) for steel (first revision)'.

5.2 Core Hardness — Core hardness for the material shall conform to those given for the materials in 2.

6. General Requirements

6.1 Ovality — The difference between the maximum and minimum external diameter of each cross section shall not exceed the group tolerance for outside diameter (see Table 1).

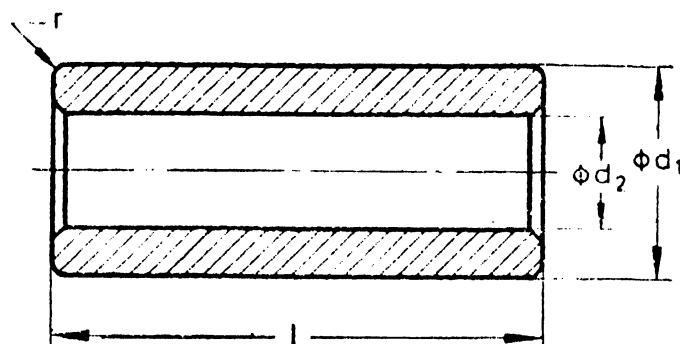
Adopted 27 June 1985

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TABLE 1 TOLERANCES ON DIMENSIONS OF GUDGEON PINS

(Clause 4.1)



Outside corners may alternatively be chamfered to $0.5 \times 45^\circ$ and shall be free from sharp edges.

All dimensions in millimetres.

For Outside Diameter d_1	*Tolerances for			Bore d_2	Length l
	†Outside Diameter d_1				
	Total h_4	Colour Group			
White		Black			
Up to 10	0 -0.004	0 -0.002	-0.002 -0.004	0 -0.3	0 -0.3
Above 10 Up to 18	0 -0.005	0 -0.002 5	-0.002 5 -0.005	0 -0.3	0 -0.3
Above 18 Up to 30	0 -0.006	0 -0.003	-0.003 -0.006	0 -0.3	0 -0.3
Above 30 Up to 50	0 -0.007	0 -0.003 5	-0.003 5 -0.007	0 -0.3	0 -0.3
Above 50 Up to 65	0 -0.008	0 -0.004	-0.004 -0.008	0 -0.3	0 -0.3
Above 65 Up to 80	0 -0.010	0 -0.005	0.005 -0.010	0 -0.3	0 -0.3

*The maximum error permissible in the measurement shall be 0.001.

†The tolerance on outside diameter may be generally divided into two groups marked with white or black colour. This marking is to be made in the bore, and the piston should also bear the same colour mark. A further distinction within a colour group is not recommended. When piston to pin fit is the criteria, colour coding may be resorted to, to more than two grades depending on the particular requirement in which case the total tolerance may be correspondingly increased. If by measurement any particular pin lies in both the colour groups, then average value is the deciding factor.

Although a straight bore is generally preferred, other bores, such as tapered or stepped may be used where desired. Outside corners may alternatively be chamfered to $0.5 \times 45^\circ$ and shall be free from sharp edges.

6.2 Permissible Taper — The difference between the maximum and minimum external diameter measured along the same generating line of cylinder shall not exceed half the allowed tolerance (same as group tolerance) for outside diameter (see Table 1).

AMENDMENT NO. 1 APRIL 1987

TO

IS:6740-1985 SPECIFICATION FOR GUDGEON PINS FOR
INTERNAL COMBUSTION ENGINES

(First Revision)

(Page 3, clause 6.6, informal table, under
'Surface Roughness') - Substitute '0.06' for
'0.006'.

(Page 3, clause 6.6, second para) - Delete
'Ra Max'.

(EDC 14)

6.3 Permissible deviation due to the combined effect of ovality and taper shall be as follows:

<i>Outside Diameter</i> mm	<i>Permissible Deviation</i> mm
Up to 20	— 0.002
Above 20 up to 40	— 0.003
Above 40 up to 60	— 0.004
Above 60	— 0.005

6.3.1 In case of gudgeon pins with milled slot or radial hole, an additional 0.001 mm is permissible in the vicinity of these spots.

6.3.2 No diametral dimension shall lie outside the respective tolerance by more than 0.001 mm up to 55 mm diameter, or 0.002 mm over 55 mm diameter.

6.4 Permissible variations of outside diameter (concentricity tolerance) owing to out-of-centre or inclined boring shall be as follows :

<i>Outside Diameter d_1</i> mm	<i>Concentricity Tolerance (TIR)</i> mm
Up to 25	0.25
Above 25 up to 50	0.35
Above 50	0.5

6.5 Case Depth — The case depth is defined as the vertical distance from the surface to the point where a hardness of 550 HV for plain carbon steel or 500 HV for alloy steel is present in the transition from the lower core hardness to the higher value at the surface. This shall be determined by the Vickers hardness method using 1 or 2.5 kg load [see IS : 1501-1968 'Method for Vickers hardness test for steel (first revision)'].

6.5.1 Depth of the case, outer and inner together shall not be more than one-third of the wall thickness.

6.6 Surface Roughness — Surface roughness as determined by the method given in IS : 3073-1967 'Assessment of surface roughness', shall not be more than the limits specified below:

<i>Dimension</i> mm	<i>Surface Roughness, R_a Max, μm</i>
Outer diameter d_1	
Up to 50	0.006
Above 50	0.08
Bore	5.00
End faces	5.00

The maximum permissible deviations in the depth of surface roughness R_a , Max shall be as given below:

Outer diameter d_1	
Up to 50 mm	0.8 to 1.25 μm
Above 50 mm	1.1 to 1.6 μm
Bore	30 μm
End faces	30 μm

The number of deviation for outer diameter of gudgeon pins shall be five while for the bore is two over a length of 12.5 mm or $0.3 \times d_1$.

6.6.1 End faces and/or inside edge chamfers may be machined before hardening and they shall therefore become grey in colour due to surface oxidation. There shall be no loose or flaking scale on the resultant surface.